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ABSTRACT

The environment we live in today is filled with human-created electromagnetic fields generated by a variety of sources, including radio and television transmitters, power lines, and visual display terminals. (In addition, there exists a natural background of electromagnetic fields.) The term "electromagnetic pollution" is often used to describe the recent proliferation of artificial sources of electromagnetic fields in our environment. This document was developed to help the interested reader locate materials in the collections of the Library of Congress on the biological and health effects of electromagnetic fields. Although it was intended to be a comprehensive bibliography, it is designed to provide the reader with a set of resources that can be used to focus on the topic. The document lists the subject headings used by the Library of Congress in cataloging information on electromagnetic radiation. It also contains citations of materials categorized as: (1) brief introductions; (2) basic texts; (3) additional titles; (4) handbooks and encyclopedias; (5) other bibliographies; (6) conference proceedings; (7) government publications; (8) abstracting and indexing services; (9) journal articles; (10) technical reports; and (11) additional sources of information. (TW)

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BIOLOGICAL AND HEALTH EFFECTS OF ELECTROMAGNETIC (NONIONIZING) RADIATION

Compiled by Hisako Halasz

TB 86-5 November 1986

SCOPE: The environment we live in today is filled with man-made electromagnetic fields generated by a variety of sources, including radio and TV transmitters, power lines, and visual display terminals. In addition to these artificially created electromagnetic fields, there also exists a natural background of electromagnetic fields.

Electromagnetic energy may vary greatly in frequency, i.e., ranging from low energy, ultra-low frequency to high energy cosmic rays. The higher energy portion of the electromagnetic spectrum is generally referred to as "ionizing radiation" and includes cosmic, gamma and x-rays. The lower portion of the spectrum is referred to as "non-ionizing radiation" and includes visible light, ultraviolet (slightly ionizing at the higher end) and infrared radiation, microwaves, radiowaves and lower frequencies. Because of its low energy levels, concern over the health effects of nonionizing radiation is not as widespread as it is for ionizing radiation.

The term "electromagnetic pollution" is often used to describe the recent proliferation of artificial sources of electromagnetic fields in our environment. Sources referred to by this term generally are exclusive of visible light, ultraviolet and infrared rediation. The electromagnetic spectrum covered by this guide follows the narrower definition above, namely, nonionizing electromagnetic fields from extremely low frequencies (ELF) to just below infrared.

While an extensive body of scientific and epidemiologic data has been accumulated, adverse biological and health effects of electromagnetic fields, thus defined, have not been conclusively demonstrated, with the exception of microwave thermal effects at higher intensities.

The following guide complements two previous guides, Low-Level Ionizing Radiation--Health Effects (TB 80-5) and Microwaves (TB 79-6) and is intended to help the interested reader locate materials in the collections of the Library of Congress on the biological and health effects of electromagnetic fields. Not meant to be a comprehensive bibliography, it is designed--as the name of the series implies--to put the reader "on target."

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INTRODUCTIONS

Lerner, Eric J. Biological effects of electromagnetic fields. IEEE spectrum, v. 21, May 1984: 57-69. TK1.I15 and Pamphlet box*

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SUBJECT HEADINGS used by the Library of Congress, under which books on the biological and health effects of electromagnetic radiation can be located in most card, book, and online catalogs, include the following:

ELECTRIC FIELDS--PHYSIOLOGICAL EFFECT (Highly relevant)
ELECTRIC LINES--OVERHEAD--HYGIENIC ASPECTS (Highly relevant)
ELECTRIC POWER DISTRIBUTION--HIGH TENSION--HYGIENIC ASPECTS (Highly relevant)
ELECTROMAGNETISM--HYGIENIC ASPECTS (Highly relevant)
ELECTROMAGNETISM--PHYSIOLOGICAL EFFECT (Highly relevant)
MAGNETIC FIELDS--PHYSIOLOGICAL EFFECT (Highly relevant)
MICROWAVES--HYGIENIC ASPECTS (Highly relevant)
MICROWAVES--PHYSIOLOGICAL EFFECT (Highly relevant)
RADIO WAVES--HYGIENIC ASPECTS (Highly relevant)
RADIO WAVES--PHYSIOLOGICAL EFFECT (Highly relevant)
RADIATION--PHYSIOLOGICAL EFFECT (Relevant)
RADIATION, BACKGROUND--PHYSIOLOGICAL EFFECT (Relevant)
See also names of individual instruments or devices which are capable of emitting electromagnetic radiation, when followed by subject subdivision "HYGIENIC ASPECTS" or "PHYSIOLOGICAL EFFECT," e.g., VIDEO DISPLAY TERMINALS--HYGIENIC ASPECTS

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RC965.E4S78

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AD-A111 190**
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See Appendix 1, "Chronology of the Bibliography and Supplements," to determine AD numbers for the Bibliography and Supplements.
See Appendix 2, "Listing of Bibliographic Supplements on 'Bioeffects of RF/Microwave Radiation' which have appeared in the Bioelectromagnetics Society's Newsletter." Pamphlet box*

Reilly, J. Patrick. Human reactions to ELF electric and magnetic fields: an annotated bibliography of current literature. Laurel, Md., Johns Hopkins University, Applied Physics Laboratory, 1983. 88 p. QP82.2.E43R44 1983
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Includes bibliographies.

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Includes bibliographical references.

Proceedings of a workshop on radiofrequency radiation bioeffects, 11-13 September 1984. Sponsored by Defense Research Group, Panel VIII, NATO AC/243. Editor, John C. Mitchell. Brooks Air Force Base, Tex., USAF School of Aerospace Medicine, Aerospace Medical Division (AFSC), April 1985. 233 p. (ULAFSAM-TP-85-14) AD-A157 090**
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Includes bibliographies.

In many cases, conference proceedings or abstracts are published in journals. They can be identified through the abstracting and indexing publications listed in the ABSTRACTING AND INDEXING SERVICES section of this guide or through more specialized indexes to conference proceedings, such as Conference Papers Index (Z7403.C84*) or Index to Scientific & Technical Proceedings (Z7403.I4*). Some examples of conference material published in journals are given below.

Papers from the Symposium on Health Aspects of Nonionizing Radiation appear in New York Academy of Medicine's Journal, v. 55, Dec. 1979, p. 973-1296. R15.N62

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Translated abstracts of papers from the All-Union Symposium on the Biological Effects of Electromagnetic Fields, held in Pushchino, U.S.S.R., in 1982, can be found in Biological Effects of Nonionizing Electromagnetic Radiation, v. 9, Dec. 1984, p. 1-73. Pamphlet box*

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"At head of title: 96th Congress, 1st session. Committee print."

ABSTRACTING AND INDEXING SERVICES that index relevant journal articles and other literature are listed below. Some terms are suggested as aids in searching.

Abstracts on Health Effects of Environmental Pollutants (1972-) RA565.A1A26*
See: Keyword of interest, e.g., Electromagnetic (Field(s), Frequency, etc.), Microwave (Exposure, Radiation, etc.)

Applied Science & Technology Index (1913-) Z7913.I7*
See: Electromagnetic Fields--Physiological Effect
Microwaves--Physiological Effect
Radio Waves--Physiological Effect

Biological Abstracts (1926-) QH301.B37* and Biological Abstracts/RRM (1967-) Z53211.B672*
See: Keyword of interest, e.g. Electromagnetic (Field(s) Exposure, Radiation, etc.), Extremely-Low-Frequency, ELF, Nonionizing Radiation, Radiofrequency (Exposure, Radiation, etc.), RF

Biological & Agricultural Index (1916-) Z5073.A46*
See: Electromagnetic Waves--Biological Effect
Microwaves--Biological Effect

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See: Headings beginning Electromagnetic; Microwave; Radiation, Nonionizing; Radiofrequency

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See: Electromagnetics
Microwaves
Radiation, Non-ionizing
Radio Waves

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See: Electromagnetic Radiation--Biological Radiation Effects
Electromagnetic Radiation--Dose Limits
Electromagnetic Radiation--Radiation Protection
Long Wave Radiation
Microwave Radiation--Biological Effects
Microwave Radiation--Biological Radiation Effects
Microwave Radiation--Prenatal Irradiation
Microwave Radiation--Pulsed Irradiation
Microwave Radiation--Radiation Protection

Magazine Index (1980-) uncataloged
See: Electromagnetic Fields
Electromagnetic Waves--Environmental Aspects
Electromagnetic Waves--Medical Use
Electromagnetic Waves--Physiological Aspects
Microwaves--Environmental Aspects
Microwaves--Medical Use
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Radio Waves

Readers' Guide to Periodical Literature (1900-) AI3.R45
See: Electromagnetic Fields--Physiological Effects
Electromagnetic Therapy
Electromagnetic Waves--Physiological Effects
Microwaves--Physiological Effects

JOURNALS that often contain articles on physiological and health effects of electromagnetic radiation are

Bioelectromagnetics QP82.2.E43B53
Bioelectrochemistry and Bioenergetics QP341.B53
Journal of Bioelectricity QP341.J66
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USSR Report. Life Sciences. Effects of Nonionizing Electromagnetic Radiation (JPRS) (available in LM133 and LJ140A)
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See: Electromagnetism--Physiological Effect
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SELECTED TECHNICAL REPORTS, sold by the National Technical Information Service, Springfield, Virginia 22161, include the following:

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Meltz, Martin L., and Kathleen A. Walker. Genetic effects of microwave exposure on mammalian cells in vitro: volume 1. San Antonio, Tex., University of Texas Health Science Center, June 1984. 39 p. (USAFSAM-TR-84-22) AD-A145 946**

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Nichols, Christina. Power towers: are high-voltage lines dangerous? Environmental action, v. 17, May/June 1986: 26-27.

ADDITIONAL SOURCES OF INFORMATION

Center for Devices and Radiological Health
U.S. Food and Drug Administration
5600 Fishers Lane
Rockville, Maryland 20857
Telephone: (301) 443-4690

National Council on Radiation Protection and Measurements (NCRP)
7910 Woodmont Ave., Suite 1016
Bethesda, Maryland 20814
Telephone: (301) 657-2652

Office of Radiation Programs
Office of Air and Radiation
U.S. Environmental Protection Agency
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Telephone: (202) 475-9605

Office of Spectrum Management
National Telecommunications and Information Administration
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